

REMARKS

After entry of the present Amendment, claims 1-13 remain pending in the subject application with claim 1 in independent form. Claim 13 is new and further specifies that the cured silicone body of claim 13 is selected from the group of cured silicone soft rubber, cured silicone hard rubber, and cured silicone resin. Support for new claim 13 can be found in at least paragraph [0056] of the subject application as filed. No claims are amended, and no claims are cancelled. No new matter has been added through the present Amendment.

Claims 1 and 5-12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ikeno et al. (United States Pat. No. 5,571,853) in view of Miyajima et al. (United States Pat. Appl. Publ. No. 2002/0015748). In addition, Claims 1-4 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Zhu (United States Pat. No. 6,509,423) in view of Miyajima et al. As set forth in greater detail below, the Applicants respectfully traverse the rejections over Ikeno et. al. in view of Miyajima et. al. as well as the rejections over Zhu in view of Miyajima et al. and submit that the present claims are both novel and non-obvious over the prior art.

As to the Rejection of Claims 1 and 5-12 Under 35 U.S.C. §103(a)

With respect to claims 1 and 5-12, the Examiner contends that Ikeno et al. discloses a curable silicone composition comprising: (A) an organopolysiloxane having at least two silicon-bonded hydrogen atoms per molecule; (B) an organopolysiloxane having at least two silicon-bonded hydrogen atoms per molecule; (C) a platinum-type catalyst; and (D) a filler. However, the Applicants respectfully submit that the Examiner has not properly set forth the requisite *prima facie* case of obviousness.

As the Examiner is aware, 35 U.S.C. §103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734, 82 USPQ2d 1385, 1391 (2007). Further, the question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966). See also *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. at 1734, 82 USPQ2d at 1391. In addition, the MPEP provides seven examples of rationales for establishing a *prima facie* case of obviousness. Should the Examiner utilize any other methodology to establish obviousness, a commensurate level of specificity is required.

Ikeno et al. does not disclose, teach, or suggest the cured silicone body as claimed in claim 1 of the subject application. Instead, Applicants respectfully point out that Ikeno et al. is directed toward a “gel-forming silicone composition.” Silicone gels are well known in the silicone art and it is generally known to characterize silicone gels by their viscosity and/or hardness. As defined by Ikeno et al., silicone gels are “cured silicon products which have so-called ‘rubber hardness’ values of 0 because of their extremely low crosslink density, as contrasted to other cured silicone compositions such as elastomers and resins.” (see at least Column 1, lines 14-17). Not only does Ikeno et al. define what is meant be a silicone gel, but Ikeno et al. also distinguishes silicone gel from other silicone compositions, such as

elastomers and resins. In addition, it is an object of Ikeno et al. to provide a “gel-forming silicone composition capable of giving a silicone gel with low modulus of elasticity.” (see at least Column 1, lines 58-60) (emphasis added). As known in the art, the modulus of elasticity is the mathematical description of the silicone gel’s tendency to be deformed elastically upon the application of a force. The lower the modulus of elasticity of the silicone gel, the greater the tendency of a silicone gel to be deformed elastically upon the application of a force. To summarize, the silicone gel of Ikeno et al. has a rubber hardness of 0, a low crosslink density, and a low modulus of elasticity. Conversely, the cured silicone body formed in the claimed method of the subject application is generally a cured silicone soft rubber, cured silicone hard rubber, or cured silicone resin. (see at least Paragraph [0056] of the specification of the subject application as filed). Cured silicone soft rubbers, cured silicone hard rubbers, and cured silicone resins are, as is known in the silicone art, clearly distinguishable both physically and chemically from gels. This is even admitted by Ikeno et al. This fact is exemplified by the Examples of Ikeno et al. in view of those of the subject application. In both Ikeno et al. and the subject application, the modulus of elasticity of each respective silicone gel or cured silicone body was measured with an instrument operating at a shear frequency of 1 Hz. In Ikeno et al., the silicone gel had a modulus of elasticity which ranged from merely 1,040 to 1,340 dyn/cm² (see at least Table 1 and Column 5, lines 30-34). Conversely, in the subject application, the cured silicone body had a modulus of elasticity which ranged from 25 to 40 MPa which, when converted to dyn/cm², equals 250,000,000 to 400,000,000 dyn/cm², which is several orders of magnitude larger than the modulus of

elasticity of the silicone gel formed in Ikeno et al. Thus, Ikeno et al. does not disclose, teach, or suggest the cured silicone body of the subject invention.

In addition, the Examiner is respectfully reminded that when making a determination of obviousness, the focus should be on what a person of ordinary skill in the pertinent art would have known at the time of the invention, and on what such a person would have reasonably expected to have been able to do in view of that knowledge. See MPEP § 2141(II). As the Examiner surely appreciates, chemistry itself is an inherently unpredictable discipline. As such, the question of “what is obvious to a person of ordinary skill in the art” must not be answered with mere conclusory arguments relative to a modified prior art reference that oversimplifies the ultimate question. More specifically, an assumption that one of skill in the art would have reasonably been expected to arrive at the instant invention is insufficient and inappropriate, especially relative to a chemistry-based invention, where the prior art is directed to a silicone gel having a different chemical structure, chemical properties, and physical properties, than the cured silicone body of the subject application.

The Examiner has not set forth any reason why a person of skill in the art would be motivated to modify Ikeno et al. to arrive at a composition which forms a cured silicone body other than a silicone gel. In particular, in Ikeno et al., the silicon-bonded alkenyl groups and the silicon-bonded hydrogen groups react via an addition reaction to form the silicone gel. As such, the number of silicon-bonded alkenyl groups contributes to the cross-link density of the silicone gel formed from the addition reaction. As set forth above, the silicone gel formed in Ikeno et al. has a low crosslink density. Therefore, upon full consideration of

Ikeno et al., one of skill in the art would select an organopolysiloxane having minimal alkenyl groups per molecule to achieve the desired low crosslink density of the silicone gel. Stated differently, upon reading Ikeno et al., one of skill in the art would select an organopolysiloxane having one alkenyl group per molecule, rather than an organopolysiloxane having at least two alkenyl groups per molecule, as claimed in the subject application, to minimize the crosslink density of the silicone gel. As such, a person of skill in the art would not have modified Ikeno et al. to arrive at the claimed composition of the subject application.

Further, the Examiner has not set forth a commensurate level of specificity as to why one of skill in the art would modify Ikeno et al. to arrive at the composition claimed in the subject application. The Examiner is respectfully reminded that “rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int'l Co. v. Teleflex Inc.*, 82 USPQ2d at 1396 (quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). Because the Examiner has merely concluded that it would be obvious to combine Ikeno et al. with Miyajima et al. without setting forth any articulated reasoning as to why one of skill in the art would modify the composition disclosed in Ikeno et al. to arrive at the composition claimed in the subject invention, the Examiner has not set forth a proper *prima facie* case of obviousness.

Not only has the Examiner failed to set forth a *prima facie* case of obvious with respect to the claimed composition of the subject invention, but the Examiner has not set forth a *prima*

facie case of obviousness with respect to the combination of Ikeno et al. with Miyajima et al. In particular, the Examiner admits that Ikeno et al. "does not explicitly disclose using the composition with a compression molding apparatus to seal a semiconductor device."

To address this deficiency in Ikeno et al., the Examiner relies on Miyajima et al., which discloses a compression molding apparatus. However, the Examiner is reminded that, even after *KSR Int'l Co. v. Teleflex Inc.*, "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art." *KSR Int'l Co. v. Teleflex Inc.*, 82 USPQ2d at 1396. As set forth above, Ikeno et al. forms a silicone gel which, as defined by Ikeno et al. and known throughout the art, has a rubber hardness of 0, a low crosslink density, and a low modulus of elasticity. As such, the Applicants respectfully submit that one of skill in the art would not reasonably expect the composition of Ikeno et al. to properly protect a semiconductor device from external forces and, thus, one of skill would not utilize the composition of Ikeno et al. in the compression mold of Miyajima et al.

In particular, as set forth above, the silicone gel formed in Ikeno et al. has a modulus of elasticity of merely from 1,040 to 1,340 dyn/cm². Further, because Ikeno et al. is directed toward a silicone gel, the silicone gel has a rubber hardness of 0. Such properties are undesirable for sealing semiconductor devices because the silicone gel does not properly protect the semiconductor device from external forces. In addition, Ikeno et al. states that the silicone gel may be used as a coating material for circuit components, such as capacitors. (see at least Column 1, lines 20-24 and Column 2, lines 21-23). Notably, coating an individual circuit

component is different from, and requires different physical properties from, sealing a semiconductor device.

As an example, as is known in the art, epoxy resins were generally used to seal semiconductor devices due to the hardness of epoxy resins, which protects the semiconductor device from external forces. (see, for example, U.S. Pat. Nos. 5,043,211; 5,644,003; 6,214,904; etc.) Because epoxy resins offer desirable hardness and protection to semiconductor devices, a person of skill in the art would have no reason whatsoever to replace epoxy resins with the silicone gels of Ikeno et al., which have undesirable hardness and cannot offer semiconductor devices with comparable protection from external forces. In addition, with respect to Miyajima et al., there is no mention whatsoever of using silicone resins in the compression mold. In particular, Miyajima et al. states that “thermosetting resin is used in many cases, but thermoplastic resin may be used.” (see at least Paragraph [0057] of Miyajima et al. as published). As such, there is no reason whatsoever that a person of skill in the art would reasonably expect a silicone gel of Ikeno et al. to properly seal and protect semiconductor devices after compression molding in the compression mold of Miyajima et al.

For the reasons set forth above, the Applicants respectfully submit that one of skill would not have reasonably expected to have been able to utilize the silicone gel of Ikeno et al. in the compression mold of Miyajima et al. See MPEP § 2141(II). Stated differently, at the time of this invention, there is no reason whatsoever that one of skill in the art would modify the composition of Ikeno et al. to arrive at the composition utilized in the subject invention, and utilize this composition in the compression mold of Miyajima et al. to seal semiconductor

devices. As such, the Applicants respectfully traverse the Examiner's rejections under 35 U.S.C. § 103(a) over Ikeno et al. in view of Miyajima et al.

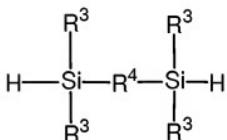
As to the Rejection of Claims 1-4 Under 35 U.S.C. §103(a)

With respect to claims 1-4, the Examiner contends that Zhu discloses a curable silicone composition comprising the following: (A) an organopolysiloxane having at least two alkenyl groups per molecule; (C) a platinum-type catalyst; and (D) a filler. The Examiner further contends that Zhu discloses that the organopolysiloxane (A) may comprise a single or a mixture of two or more organopolysiloxane resins and, in the latter case, a second organopolysiloxane can be Component (B), which is an organopolysiloxane having at least two silicon bonded hydrogen atoms per molecule. The Examiner cites Column 5, lines 16-27. The Applicants respectfully submit that the Examiner has once again misinterpreted the teachings of Zhu because there is no disclosure whatsoever in Zhu of Component (B), as explained in detail below.

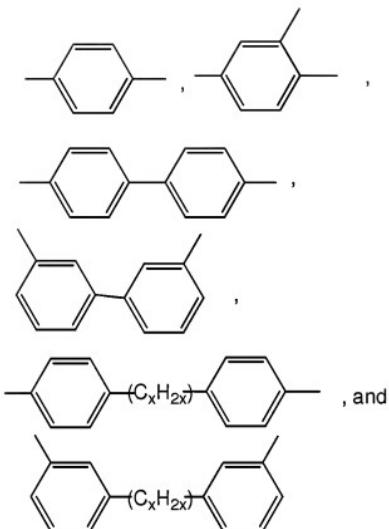
In particular, Column 5, lines 16-27 enumerate several organopolysiloxane resins which may be used in combination in Component (A), which is an organopolysiloxane having at least two alkenyl groups per molecule, not an organohydrogensiloxane having at least two silicon bonded hydrogen groups per molecule, i.e., Component (B). Therefore, Component (A) has alkenyl functionality. Notably, in addition reactions pertaining to polysiloxanes, silicon bonded alkenyl groups of organopolysiloxanes react with silicon bonded hydrogen groups of organohydrogensiloxanes. Therefore, one of skill would not include an organopolysiloxane having at least two silicon bonded hydrogen atoms with Component (A), which has alkenyl

functionality, because it could initiate the addition reaction. Further, in Column 5, lines 16-27, there is no mention whatsoever of any organopolysiloxanes having a silicon-bonded hydrogen group. Rather, each of the organopolysiloxanes enumerated have alkenyl functionality. Simply because Zhu states that the Component (A) may comprise a blend of organopolysiloxanes does not mean that the Examiner can speculate that non-disclosed compounds which differ in chemical structure and functionality are necessarily present.

Even if the Examiner meant to state that Component (B) of Zhu may contain a blend of organohydrogensilanes, as set forth in Column 6, lines 65-57 the Applicants respectfully submit that Zhu does not disclose (B) an organopolysiloxane having at least two silicon-bonded hydrogen atoms per molecule. Further, because an organohydrogensiloxane is not an organohydrogensilane, a blend of organohydrogensilanes would not include organohydrogensiloxanes, as utilized in the subject invention. Zhu discloses an organohydrogensilane having the formula



where R³ is a hydrocarbyl group free of aliphatic unsaturation and R⁴ is a hydrocarbylene group having a formula selected from:



wherein x is from 1 to 6. That is, Component (B) as described by Zhu differs significantly from Component (B) of the subject application.

The Examiner is respectfully reminded that organohydrogensilanes are free from siloxane bonds, i.e., Si-O bonds. Therefore, the silicone resin composition of Zhu differs from the curable silicon composition of the subject application. This significant difference between Component (B) of Zhu and Component (B) of the subject invention affects reactivity and curing of the curable silicone composition of the subject invention. Further, Zhu fails to teach that an organopolysiloxane having at least two silicon-bonded hydrogen atoms per molecule can be used in place of an organohydrogensilane for Component (B) of

the subject invention. Even though Zhu states that Component (B) may be a blend of organohydrogensilanes, it is notable that all organohydrogensilanes are free from siloxane bonds, as set forth above. Therefore, Zhu fails to teach that an organohydrogensiloxane having at least two silicon bonded hydrogen atoms per molecule may be utilized in combination with the claimed organohydrogensilane of Zhu. As such, the Applicants respectfully submit that the Examiner has misstated (1) the scope and content of the prior art and violates the standards for establishing a *prima facie* case of obviousness set forth by *Graham*. That is, the prior art does not include each element claimed. For this reason, the Examiner has failed to establish *prima facie* obviousness over the combination of Zhu and Miyajima et al.

The Applicants' remarks with respect to the impropriety of the combination of Zhu and Miyajima et al. in the Amendment dated June 27, 2008 are again applicable here. However, restatement of these remarks is not necessary due to the fact the Examiner has not set forth a proper *prima facie* case of obviousness for other reasons, as clearly set forth above. The Applicants respectfully submit that the reasoned statements set forth above effectively traverse the Examiner's rejection of claims 1-4 under 35 U.S.C. §103(a) over Zhu in view of Miyajima et al.

In view of the foregoing, the Applicants submit that independent claim 1, as well as claims 2-13 that depend from claim 1, are both novel and non-obvious over the prior art including the combination of Ikeno et al and Miyajima et al as well as the combination of Zhu

and Miyajima et al. As such, the Applicants believe the application is now in condition for allowance, and allowance is respectfully requested.

This Amendment is timely filed; thus, it is believed that no additional fees are due. However, if necessary, the Commissioner is authorized to charge Deposit Account 08-2789 in the name of Howard & Howard Attorneys, P.C. for any additional fees or to credit the account for any overpayment.

Respectfully submitted,

HOWARD & HOWARD ATTORNEYS

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Date

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